NHDOT SPR2 PROGRAM
RESEARCH PROGRESS REPORT

INSTRUCTIONS:

Project Managers and/or research project investigators should complete a progress report at least every three months during the project duration. Reports are due the 5th of the month following the end of the quarter. Please provide a project update even if no work was done during this reporting period.

Project # 26962P		**Report Period** Year: 2016 ☐Q1 (Jan-Mar) ☐Q2 (Apr-Jun) ☐Q3 (Jul-Sep) ☒Q4 (Oct-Dec)
Project Title: Reducing Cracking in New Bridge Curbs		
Project Investigator: Eshan Dave **Phone: 603-862-5268**		**E-mail: eshan.dave@unh.edu**
Research Start Date: December 1, 2016	**Research End Date:** September 30, 2019	**Project schedule status:** ☒ On schedule ☐ Ahead of schedule ☐ Behind schedule

Brief Project Description: In recent years a number of newly constructed concrete curbs NHDOT bridges have suffered from premature early age cracking. This project focusses on proposing necessary changes to the materials specifications as well as construction and maintenance practices to lower propensity for early age cracking. The scope of project involves development of a crack measurement system to quantify cracking in curbs, use the measurement system on number of newly constructed curbs with different trials of concrete types (different cementitious material amounts, water amounts etc.) and, construction and curing strategies. Analysis of results from field trials and development of recommendations.

Progress this Quarter (include meetings, installations, equipment purchases, significant progress, etc.):

This project started during the very last month of the quarter reported here. A parallel effort on development of the crack measurement system started in September. The crack measurement system is being developed through a Civil and Environmental Engineering senior project by team of three undergraduate students. Eshan Dave from UNH (who is also PI of this project) and, Beth Klemann and Andy Hall from NHDOT are supervising this project. Weekly meetings were held between students and supervisors to discuss the progress on development of the crack measurement system. A field visit was also conducted in the past quarter by project PI and senior design students along with Andy Hall from NHDOT to visit several bridge sites to observe different curb configurations as well as some examples of early age concrete cracking. Finally, an undergraduate researcher was recruited for working on this project during the reported quarter. Eric Caron will start to work on the project from January 3rd 2017, he will begin his M.S. in Civil Engineering in Fall of 2017 and will focus his M.S. thesis research on the topic of this research study.

Items needed from NHDOT (i.e., Concurrence, Sub-contract, Assignments, Samples, Testing, etc…):

As detailed in the work-plan, NHDOT is expected to hire a summer student intern for June – August 2017 to continue progress on the research. During the upcoming quarter, NHDOT should ensure that necessary steps are taken to hire student intern. Any available data on the QC and QA testing of concrete form bridge curbs as well as mix batching information would be needed from NHDOT to complete review of current practices.

Anticipated research next 3 months:

Following key topics will be undertaken by the research team during next 3 months:

(1) Project kick-off meeting. Meeting between researchers and the project technical advisory group (TAG) will be scheduled during January 2017 to discuss the project work-plan and schedule.
(2) Finalization of the crack measurement system. Finalized system will also be tested on existing bridge curbs to test the system.
(3) Conduct review of current practices. This will include review of concrete mix proportions used on existing curbs as well as data on cracking performances for existing curbs.
(4) Conduct literature review on to finalize different combinations of concrete mix types and curing methods for lowering propensity of early age cracking in bridge curbs.
(5) Develop memo on review of current practices and work with NHDOT staff to identify locations for field trials.

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Circumstances affecting project: Describe any challenges encountered or anticipated that might affect the completion of the project within the time, scope, and budget, along with recommended solutions to those problems.

No challenges are encountered until this point in project. The start of project was delayed from estimated start of September 2016 to December 2016 due to delay in contracting. No adverse impacts have been identified until this point due to start date delay.

Tasks (from Work Plan)	Planned % Complete	Actual % Complete
1. Review of Current Practices	14	14
2. Construction of Concrete Curbs	0	0
3. Survey of Concrete Curbs for Cracking Performance	0	0
4. Analysis of Results and Recommendation Development	0	0